FIG. 1

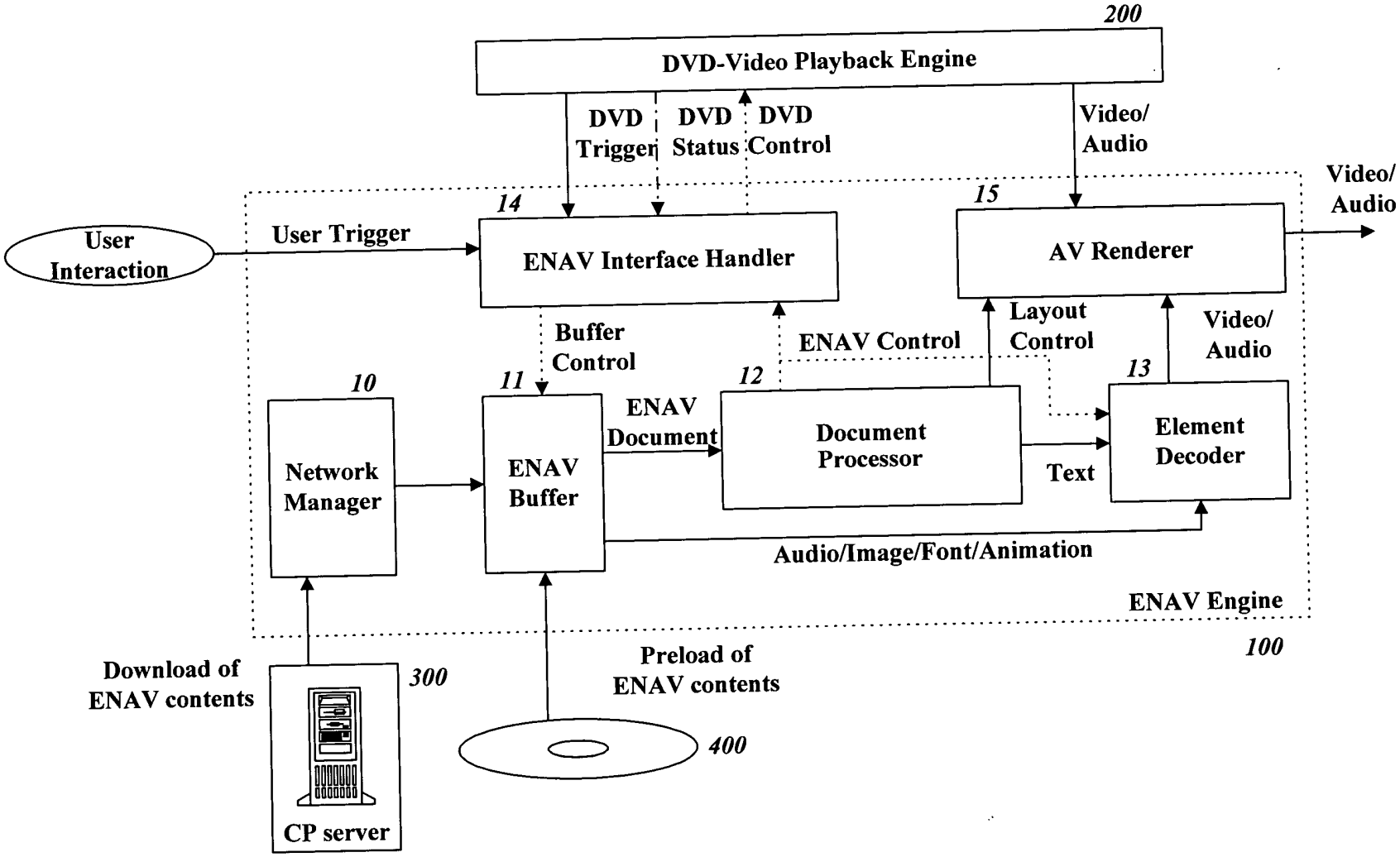
200
DVD-Video Playback Engine
DVD Trigger
DVD Status
DVD Control
Video/ Audio
Video/ Audio
14
15
User Interaction
User Trigger
ENAV Interface Handler
AV Renderer
Buffer Control
ENAV Control
Layout Control
Video/ Audio
10
11
12
13
Network Manager
ENAV Buffer
ENAV Document
Document Processor
Element Decoder
Text
Audio/Image/Font/Animation
ENAV Engine
100
Download of ENAV contents
300
Preload of ENAV contents
400
CP server

FIG. 2

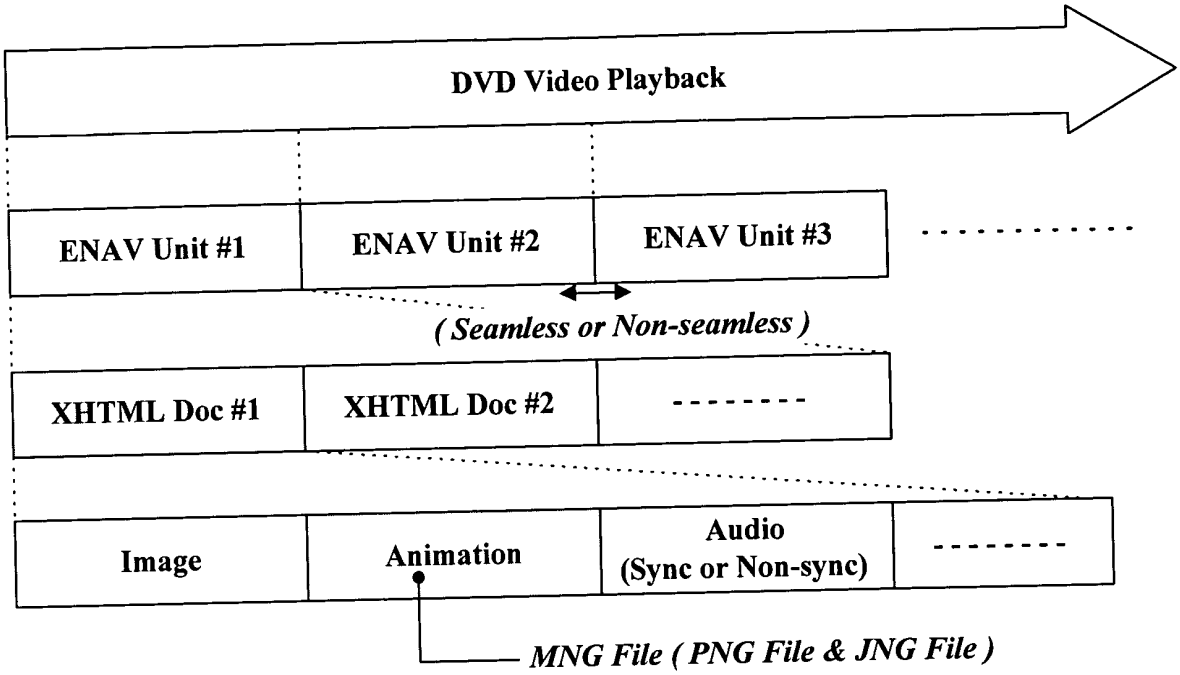
DVD Video Playback
ENAV Unit #1
ENAV Unit #2
ENAV Unit #3
(Seamless or Non-seamless)
XHTML Doc #1
XHTML Doc #2
Image
Animation
Audio
(Sync or Non-sync)
MNG File (PNG File & JNG File)

FIG. 3

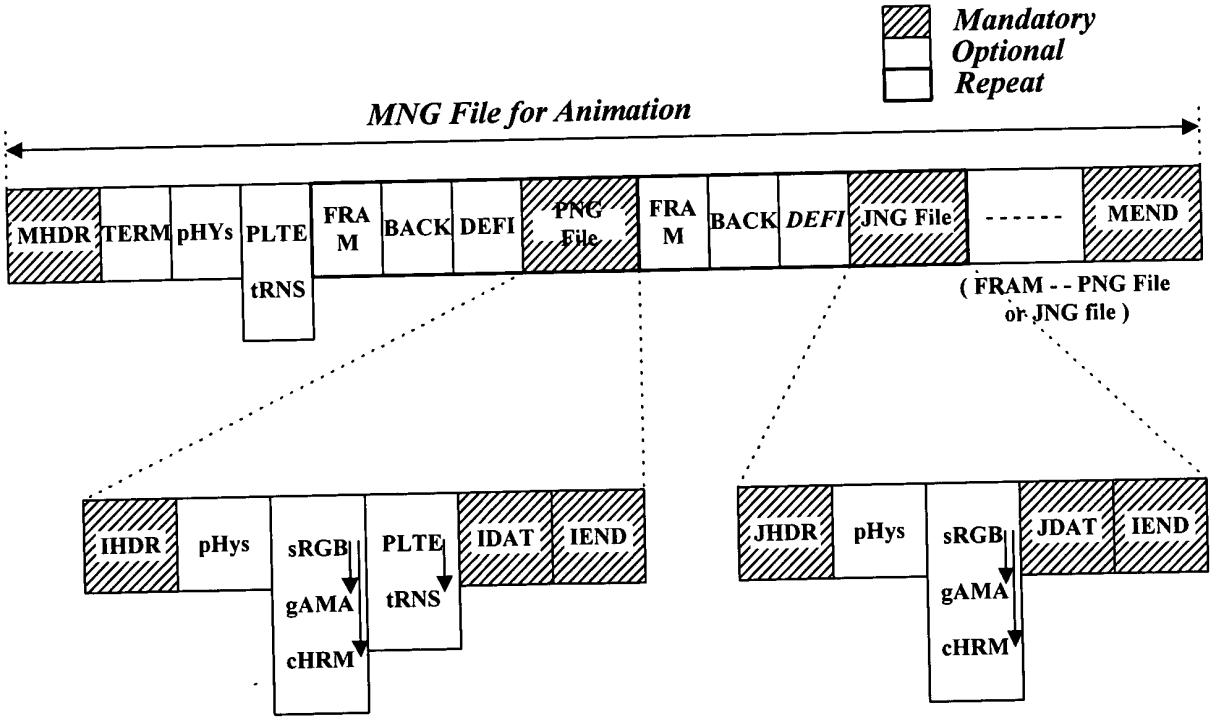
Mandatory
Optional
Repeat
MNG File for Animation
MHDR
TERM
pHYs
PLTE
tRNS
FRA M
BACK
DEFI
PNG File
FRA M
BACK
DEFI
JNG File
MEND
(FRAM - - PNG File or JNG file)
IHDR
pHys
sRGB
gAMA
cHRM
PLTE
tRNS
IDAT
IEND
JHDR
pHys
sRGB
gAMA
cHRM
JDAT
IEND

FIG. 4

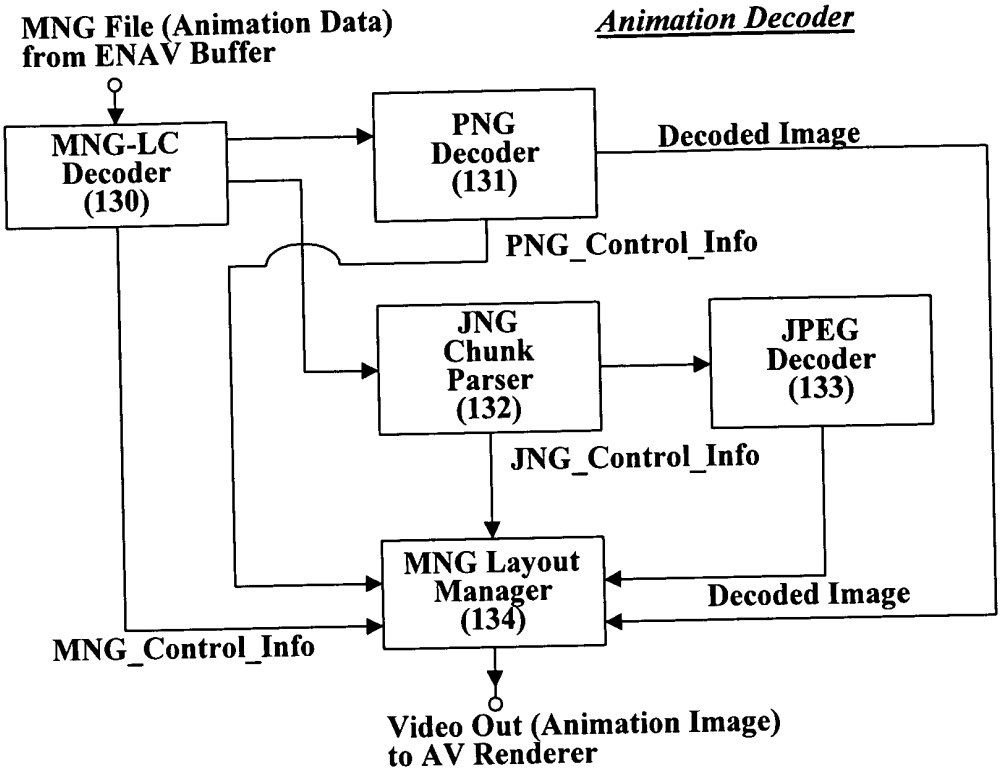

FIG. 5

Critical MNG Control Chunks

Name	Description	Attribute	Bytes	Value	Comment
MHDR	MNG datastream header	Frame_width	4B	0 to 720	Within NTSC and PAL Note
		Frame_height	4B	0 to 480 (576)	
		Ticks_per_second	4B	Up to 24	
		Nominal_layer_count	4B	-	-
		Nominal_frame_count	4B	-	-
		Nominal_frame_time	4B	-	-
		Simplicity_profile	4B	65	MNG-VLC without transparency
				457	MNG-VLC
				473	MNG-VLC with JNG
				459	MNG-LC
				475	MNG-LC with JNG
MEND	End of MNG datastream	-	0B	-	Empty chunk

FIG. 6

Critical MNG Image Defining Chunks

Name	Description	Attribute	Bytes	Value	Comment
DEFI	Define an object	Object_id	2B	0x0000	MNG_LC restriction
		Do_not_show	1B	(0x00 visible)	Only one object
		Concrete_flag	1B	0x00	MNG-LC restriction
		X_location	4B	0 to Frame_width	Default is 0
		Y_location	4B	0 to Frame_height	Default is 0
		Left_cb	4B	0 to Frame_width	Default is 0
		Right_cb	4B	0 to Frame_width	Default is Frame_width
		Top_cb	4B	0 to Frame_height	Default is 0
		Bottom_cb	4B	0 to Frame_height	Default is Frame_width
PLTE	Global palette	-	Max (256x3)B	0 to 255	-
tRNS	Global transparency array	-	Max 256B	0 to 255	Note
IHDR/ JHDR	-	-	-	-	Same format as PNG IHDR/JNG JDAT
IDAT/ JDAT	-	-	-	-	Same format as PNG IDAT/JNG JDAT
IEND	-	-	-	-	Same format as PNG IEND/JNG IEND
TERM	Termination action	Termination_ action	1B	0,1,2,3	-
		Action_after_ iteration	1B	0,1,2	Must be omitted unless Termination_action is 3
		Delay	4B	-	
		Iteration_max	4B	-	

FIG. 7

Critical MNG Image Displaying Chunks

Name	Description	Attribute	Bytes	Value	Comment
BACK	Background	Red_background	2B	-	-
		Green_background	2B	-	
		Blue_background	2B	-	
FRAM	Frame definition	-	-	-	Follow the MNG-LC version 1.0

FIG. 8

Critical PNG Chunks

Name	Description	Attribute	Bytes	Value	Comment
IHDR	Image header	Width	4B	0 to 720	Within NTSC and PAL
		Height	4B	0 to 480 (576)	Within NTSC (PAL)
		Bit Depth	1B	1,2,4,8,16	-
		Color type	1B	0,2,3,4,6	-
		Compression method	1B	0x00	-
		Filter method	1B	0x00	-
		Interlace method	1B	0x00	No interlace
PLTE	Palette	-	Max (256x3) B	0 to 255	-
IDAT	Image data	-	-	-	Note
IEND	Image trailer	-	0B	-	Empty chunk

FIG. 9

Ancillary PNG Chunks

Name	Description	Attribute	Bytes	Value	Comment
tRNS	Transparency	-	Max 256B	0 to 255	Note 1
gAMA	Image gamma	-	4B	(45455 sRGB)	Note 2
cHRM	Primary chromaticities	White point x	4B	(31270 sRGB)	Note 3
		White point y	4B	(32900 sRGB)	
		Red point x	4B	(64000 sRGB)	
		Red point y	4B	(33000 sRGB)	
		Green point x	4B	(30000 sRGB)	
		Green point y	4B	(60000 sRGB)	
		Blue point x	4B	(15000 sRGB)	
		Blue point y	4B	(6000 sRGB)	
sRGB	Standard RGB color space	-	1B	0,1,2,3	Note 4
pHYs	Physical pixel dimensions	Pixels per unit x	4B	(180,4:3) (135, 16:9)	Note 5
		Pixels per unit y	4B	(160, NTSC) (192, PAL)	
		Unit specifier	1B	0x00	

FIG. 10

Critical JNG Chunks

Name	Description	Attribute	Bytes	Value	Comment
JHDR	JNG header	Width	4B	0 to 720	Within NTSC and PAL
		Height	4B	0 to 480 (576)	Within NTSC (PAL)
		Color type	1B	8,10,12,14	-
		Image_sample_depth	1B	0x08	8bits
		Image_compression method	1B	0x08	Huffman-coded baseline JPEG
		Image_interlace_method	1B	0x00	Sequential JPEG
		Alpha_sample_depth	1B	0,1,2,4,8,16	-
		Alpha_compression method	1B	0x08	JDAA format
		Alpha_filter method	1B	0x00	-
		Alpha_interlace_method	1B	0x00	-
JDAT	Image data	-	-	-	Note
IEND	Image trailer	-	0B	-	Empty chunk

FIG. 11

Ancillary JNG Chunks

Name	Description	Attribute	Bytes	Value	Comment
gAMA	Image gamma	-	4B	(45455 sRGB)	Note 1
cHRM	Primary chromaticities	White point x	4B	(31270 sRGB)	Note 2
		White point y	4B	(32900 sRGB)	
		Red point x	4B	(64000 sRGB)	
		Red point y	4B	(33000 sRGB)	
		Green point x	4B	(30000 sRGB)	
		Green point y	4B	(60000 sRGB)	
		Blue point x	4B	(15000 sRGB)	
		Blue point y	4B	(6000 sRGB)	
sRGB	Standard RGB color space	-	1B	0,1,2,3	Note 3
pHYs	Physical pixel dimensions	Pixels per unit x	4B	(180,4:3) (135, 16:9)	Note 4
		Pixels per unit y	4B	(160, NTSC) (192, PAL)	
		Unit specifier	1B	0x00	